

PATENT SPECIFICATION (11)

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DRAWINGS ATTACHED



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(54) AN APPARATUS FOR MIXING LIQUID OR PULVEROUS MATERIAL

(71) We, SVENSKA SKANDEK AKTIE-
 BOLAGET, a Swedish Body Corporate, of
 Box 11048, S-161 11 Bromma 11, Sweden,
 do hereby declare the invention, for which
 we pray that a patent may be granted to us,
 and the method by which it is to be per-
 formed, to be particularly described in and
 by the following statement:—

The present invention relates to an
 apparatus for mixing liquid or pulverous
 materials by shaking.

Mixing by means of shaking is used, for
 example, for tinting paint, i.e. mixing a base
 paint with a tinting paint. Subsequent to
 pouring the tinting paint into the base paint,
 it is necessary to stir the mixture very
 thoroughly in order to obtain a paint of
 uniform colour. To this end it is normal to
 use an apparatus having a table provided
 with clamping means for a receptacle con-
 taining the material to be blended, the table
 being secured to an inner frame which is
 movable in relation to the outer frame,
 resting on the supporting surface, and is
 caused to move by means of a crank or
 eccentric shaft which in turn is driven by
 a motor arranged in the apparatus. Such an
 apparatus, however, possesses certain dis-
 advantages. The most serious of these is that
 the vibrations are transmitted to the outer
 frame of the apparatus, whereupon the ap-
 paratus tends to move across the surface on
 which it is supported. In order to eliminate
 this, it is necessary either to secure the ap-
 paratus to the supporting surface by means
 of bolts or the like or to weight the outer
 frame of the apparatus to such an extent
 that the apparatus remains stationary. Both
 of these methods are unsuitable since the
 apparatus should be capable of being
 moved, depending on different conditions
 prevailing at the site where the apparatus
 is used.

Another disadvantage associated with
 apparatus of the aforementioned type is that
 the mixing takes a relatively long time. This
 is partially connected with the aforemen-
 tioned problem of holding the apparatus
 stationary. In order to limit the movement

of the apparatus to a reasonable level it is
 necessary to restrict the magnitude of the
 shaking movement, which naturally reduces
 the mixing effect.

According to the present invention there
 is provided apparatus for mixing liquid or
 pulverous material by shaking, such appa-
 ratus comprising a table having clamping
 means for a receptacle which contains the
 material to be mixed, an outer frame for
 supporting the apparatus, an inner frame to
 which the table is secured and which is mov-
 able relative to the outer frame, a shaft for
 moving the inner frame relative to the outer
 frame, drive means for the shaft, and an
 intermediate frame having the shaft jour-
 nalled thereon and the drive means secured
 thereto, the inner frame being connected at
 one end thereof to the intermediate frame
 by means of at least one link, the other end
 of the inner frame being journaled to at
 least one pin arranged on the shaft and the
 intermediate frame being connected to the
 outer frame by a plurality of resilient means.

An illustrative embodiment of the inven-
 tion will now be described with reference to
 the accompanying drawing, in which:—

Figure 1 is a perspective view of one form
 of apparatus; and

Figure 2 is a perspective view of the
 apparatus illustrated in Figure 1 with the
 outer plates removed and certain portions
 cut away.

Referring now to the drawings there is
 shown apparatus which comprises a lower
 portion 1 and an upper portion 2. Arranged
 in the upper portion 2 is a table 3 for a
 receptacle, for example a paint tin 4. The
 paint tin 4 is clamped to the table 3 by
 means of a plate 5 which by means of a
 rod 6 can be adjusted to any desired dis-
 tance from the table 3, the rod 6 being
 locked in the desired position by means of
 a known quick locking device 7.

A switch 8 is arranged on the lower por-
 tion 1 for starting and stopping the appa-
 ratus. There is also provided a regulatable
 time switch 9 for setting the time for which
 the apparatus is to operate during a mixing

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sequence. This time period is selected with respect to the nature and quantity of the materials to be mixed.

Figure 2 illustrates the apparatus of Figure 1, but with the outer plates removed. For the sake of simplicity, all electrical connections have also been excluded from the Figure and a number of other components have been cut away. The table 3, which is not shown in its entirety, is attached to two stanchions 10, the upper ends of which are connected by means of a cross member 11 through which the rod 6 passes and on which the quick locking means 7 are secured. The lower portion of each stanchion 10 is journaled on a crank pin 12 on a crank shaft 13. The stanchions 10 and the cross member 11 and the table 3 together form an inner frame structure which is connected at its upper end with two stanchions 14 by means of pivotable links 15.

The stanchions 14 form part of an intermediate frame which also includes stanchions 16 and cross members 17. Secured between the stanchions 14 is a support beam 18, and a similar support beam 18 is secured between the stanchions 16. The crank shaft 13 is attached to the support beams 18 by means of bearing means 19. The crank shaft 13 is driven by means of a belt 20 passing over a belt pulley on the crank shaft and a belt pulley on an electric motor 21 arranged in the lower portion of the intermediate frame. The lower portion of the intermediate frame is also provided with weights 22.

The apparatus is also provided with an outer frame, which includes horizontal beams 23 and vertical beams 24, the lower ends of the beams 24 being provided with feet, by means of which the apparatus rests against the supporting surface. The outer frame also supports outer plates, as illustrated in Figure 1.

The intermediate frame is resilient supported in relation to the outer frame by means of four resilient means in the form of spring legs 25 provided with coil springs. The spring legs 25 are mounted between horizontal beams 23 in the outer frame and the stanchions 14 and 16 respectively in the intermediate frame.

The mode of operation of the apparatus is as follows:

A paint tin 4 or the like containing the materials to be mixed is placed on the table 3 and clamped by means of the rod 6 and the quick locking means 7. The desired mixing time is then set by means of the time switch 9 and the apparatus is started up. The motor 21 drives the crank shaft 13 via the belt 20. The stanchions 10 and the inner frame, especially its lower part, is caused to effect a circular motion in relation to the intermediate frame. Because the upper end of the inner frame is connected with the

intermediate frame by means of links 15, the inner frame will execute a generally vertical reciprocating movement at its upper end. The table 3, and thus also the paint tin 4, will effect a movement somewhere between the two aforementioned movements, and this provides a very rapid and thorough mixing effect. The intermediate frame will, in turn, execute some movements as a result of actuation from the inner frame. These movements can be partially damped by counterweights on the crank shaft 13. The said movements are also damped by the weight of the motor 21 and the weights 22. The intermediate frame, however, will execute certain movements irrespective of these measures. These movements, however, are absorbed practically completely by the spring legs 25, so that no movements are transmitted to the outer frame and to the support surface on which the apparatus rests. The spring legs 25 are suitably mounted in a manner whereby their axes extend inwardly and upwardly towards the apparatus, thereby enabling the legs to absorb not only vertical but also horizontal forces. Stop members or abutments 26 may be provided for restricting movement of the intermediate frame in relation to the outer frame.

The spring legs 25 transmit practically no movement to the outer frame and it is therefore possible to position the apparatus standing on the supporting surface without securing the apparatus with bolts or extra weights. Furthermore, the mixing movement can be selected for optimal results.

WHAT WE CLAIM IS:—

1. Apparatus for mixing liquid or pul-
verous material by shaking, such apparatus
comprising a table having clamping means
for a receptacle which contains the material
to be mixed, an outer frame for supporting
the apparatus, an inner frame to which the
table is secured and which is movable
relative to the outer frame, a shaft
for moving the inner frame relative to
the outer frame, drive means for the
shaft, and an intermediate frame having the
shaft journaled thereon and the drive means
secured thereto, the inner frame being con-
nected at one end thereof to the intermediate
frame by means of at least one link, the
other end of the inner frame being journaled
to at least one pin arranged on the shaft and
the intermediate frame being connected to
the outer frame by a plurality of resilient
means.

2. Apparatus as claimed in claim 1 in
which the resilient means are in the form of
coil springs placed with their longitudinal
axes directed at a slight angle to the vertical
in order to enable the springs to absorb high
vertical forces and smaller horizontal forces.

3. Apparatus as claimed in claim 1 or 2,

in which the resilient means are connected to the upper portion of the intermediate frame.

4. Apparatus as claimed in any one of claims 1 to 3, in which movement of the intermediate frame relative to the outer frame is restricted by abutment surfaces which are arranged on the outer frame at the lower portion thereof.

5. Apparatus as claimed in any one of claims 1 to 4, in which the intermediate frame is provided with weights for damping movement of the intermediate frame.

6. Apparatus as claimed in any one of claims 1 to 5, in which the motor is arranged in the lower portion of the intermediate frame and drives the crank shaft by means of a belt.

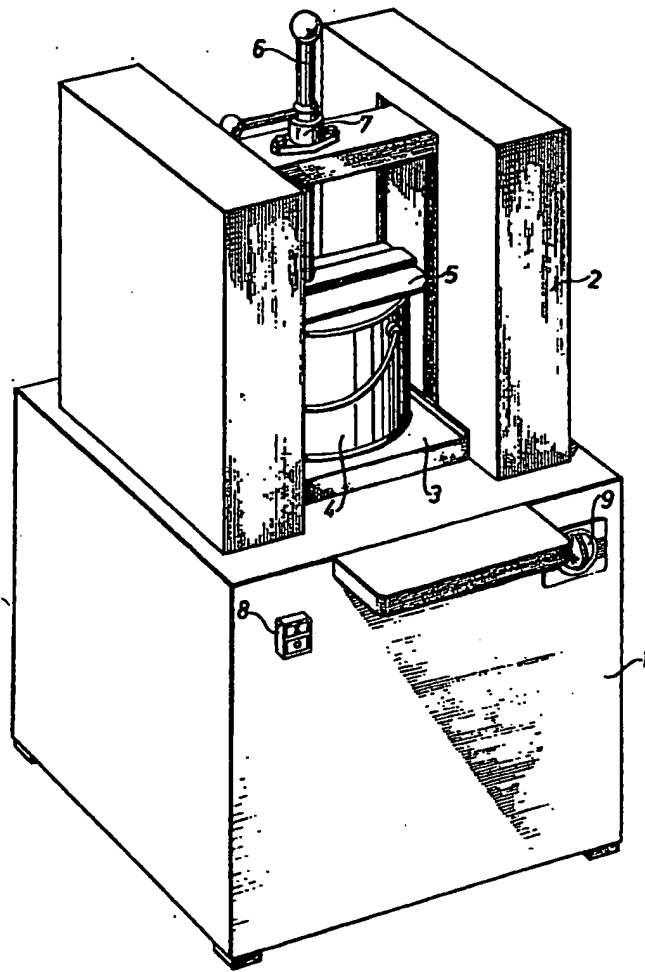
7. Apparatus as claimed in any one of

claims 1 to 6, in which the receptacle clamping means comprises a plate arranged to abut the lid of the receptacle and press the receptacle against the table, the plate being connected to a displaceable rod and movable together with the rod, and means for locking the rod in a desired position.

8. Apparatus for mixing liquid or pulverous material by shaking, such apparatus being constructed and arranged substantially as described herein with reference to and as shown by the accompanying drawings.

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Fig.1



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COMPLETE SPECIFICATION

2 SHEETS

*This drawing is a reproduction of
the Original on a reduced scale*

Sheet 2

